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| 09/913,828 | 09/18/2001 | Richard Wyrwas | 1483-19 | 4453 |

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Nixon & Vanderhye
1100 North Glebe Road 8th Floor
Arlington, VA 22201-4714

EXAMINER

PEREZ GUTIERREZ, RAFAEL

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2686

DATE MAILED: 09/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/913,828

Applicant(s)

Wyrwas

Examiner

Rafael Perez-Gutierrez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

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DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement submitted on August 20, 2001 has been considered by the Examiner and made of record in the application file.

Drawings

3. The drawings are objected to because of the following minor informality: On **figure 9a step 1016**, replace "ARAMETER" with --PARAMETER--.
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference numbers mentioned in the description on **page 6 lines 13 and 14**: Reference numbers **18a** and **18b** identifying the local loops are not shown in **figure 1**.
5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference numbers not mentioned in the description:

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- a) On **figure 1**, reference numbers **8d** and **8e** are not mentioned in the description;
 - b) On **figure 10**, reference numbers **1110** and **1114** are not mentioned in the description;
- and
- c) On **figure 11**, reference number **2012** is not mentioned in the description.

6. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office Action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended”. If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled “Replacement Sheet” in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the Examiner, the Applicant will be notified and informed of any required corrective action in the next Office Action. If a response to the present Office Action fails to include proper drawing corrections, corrected drawings or arguments therefor, the response can be held **NON-RESPONSIVE** and/or the application could be **ABANDONED** since the objections/corrections to the drawings are no longer held in abeyance.

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Specification

7. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

8. The disclosure is objected to because of the following informality: On **page 27 line 15**, a co-pending application number is incomplete (i.e., 9930.....). Appropriate correction is required.

Preliminary Amendment

9. The present Office Action is based upon the original patent application filed on September 18, 2001 as modified by the preliminary amendment also filed on September 18, 2001. **Claims 16-45** are now pending in the present application.

Claim Objections

10. **Claims 16, 21-28, 33, 34, and 40-45** are objected to because of the following informalities:

a) On **line 8 of claim 16**, replace “minimise” with --minimize-- after “to”;

b) On **line 1 of claim 21** and on **line 1 of claim 40**, insert --interference-- after “first” and after “second” in order to provide proper antecedent basis for “first interference signal” and

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“second interference signal”;

- c) On **line 6 of claim 21** and on **line 7 of claim 40**, insert --interference-- after “first”;
- d) On **line 2 of claims 22, 23, and 41-43** and on **line 1 of claim 24**, insert --estimated-- after “said” in order to clarify that the parameter is derived from the “estimated second signal”;
- e) On **line 3 of claims 24, 25, 43, and 44**, insert --interference-- after “said second”;
- f) On **line 2 of claims 26 and 45**, replace “interference” with --first--;
- g) On **line 5 of claim 27**, replace “characterising” with --characterizing-- after “data”;
- h) On **line 7 of claim 27**, replace “maximise” with --maximize-- after “to”; and
- i) On **line 4 of claim 28** and on **line 1 of claims 33 and 34**, replace “process” with --method--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the Applicant regards as his invention.

Claims 31 and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Consider **claims 31 and 32**, since the preamble of each of these claims set forth an “Interference mitigation apparatus for the system”, the metes and bounds of each of these claims

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is indefinite because it is not recited nor it is clearly understood what elements are included in the “interference mitigation apparatus” or what function does the “interference mitigation apparatus” performs. For example, if all of the limitations from claims 27 and 28 were respectively added to claims 31 and 32, the interference mitigation apparatus will lack use and functional elements. Appropriate correction/clarification is respectfully requested.

For purposes of examination, these claims were understood by the Examiner as defining an interference mitigation apparatus that incorporates the interference mitigation component recited in claims 27 and 28, respectively.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless -- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 16, 17, 20-22, 25, 26, 28, 30, 32-36, 39-41, 44, and 45 are rejected under 35 U.S.C. 102(b) as being anticipated by **Kaitsuka (U.S. Patent # 4,384,366)**.

Consider **claims 16, 17, 33, 35, and 36**, Kaitsuka clearly shows and discloses a method of mitigating interference in a user uplink signal received at a satellite from a terrestrial user terminal (column 1 lines 5-16) and an interference compensation system (interference mitigation apparatus) (figure 2A and 2B) for performing said method, comprising:

a generating component (amplitude and phase control circuit 3) (figures 2A and 2B) for

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generating an estimated interference signal I_{VM} in accordance with one or more parameters (e.g., amplitude, phase) (abstract, column 2 lines 42-52, column 3 line 65 - column 4 line 12, and column 4 lines 33-39 and 51-62);

a processing component (combiner 4) (figures 2A and 2B) for processing a signal I_M derived from said uplink signal in accordance with said estimated interference signal I_{VM} to reduce the magnitude of corresponding components within said uplink signal (abstract, column 2 lines 42-60, column 4 lines 12-25, and column 4 line 39 - column 5 line 11); and

a varying component (phase detector means, voltage integrator means, adder means) (figures 2A and 2B and column 2 line 66 - column 3 line 6) for varying one or more parameters (e.g., amplitude, phase) of said estimated interference signal I_{VM} , to determine a respective value of each said parameter to minimize the level of said components in said uplink signal (abstract, column 2 line 53 - column 3 line 6, column 4 line 39 - column 5 line 11, and column 6 lines 26-58).

Consider **claims 20 and 39**, and as applied to **claims 16 and 35 above**, Kaitsuka further discloses that said processing component (combiner 4) (figures 2A and 2B) is configured to subtract said estimated interference signal I_{VM} (abstract, column 2 lines 53-60, and column 4 lines 39-62).

Consider **claims 21, 34, and 40**, Kaitsuka also shows and discloses a method of mitigating interference between a first interference signal and a second interference signal (both read as I_{VM} (i.e., first interference signal is I_{VM} unmodified and the second interference signal I_{VM} modified) in a user uplink signal received at a satellite (abstract) and an interference

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compensation system (interference mitigation apparatus) (figure 2A and 2B) for performing said method, comprising

providing, via amplitude and phase control circuit 3, phase detector means, voltage integrator means, and adder means (first/second/fourth/fifth components) (figures 2A and 2B and column 2 line 66 - column 3 line 6), signal estimate data corresponding to at least said first interference signal I_{VM} (abstract and column 2 lines 41-52);

generating, via amplitude and phase control circuit 3, phase detector means, voltage integrator means, and adder means (first/second/fourth/fifth components) (figures 2A and 2B and column 2 line 66 - column 3 line 6), therefrom an estimated first signal I_{VM} (abstract, column 2 lines 42-52, column 3 line 65 - column 4 line 12, and column 4 lines 33-39 and 51-62);

processing, via combiner 4 (third/sixth component) (figures 2A and 2B), a signal I_M derived from said uplink signal in accordance with said estimated first signal I_{VM} to reduce the magnitude of said first interference signal I_{VM} therein (abstract, column 2 lines 42-60, column 4 lines 12-25, and column 4 line 39 - column 5 line 11);

providing, via amplitude and phase control circuit 3, phase detector means, voltage integrator means, and adder means (first/second/fourth/fifth components) (figures 2A and 2B and column 2 line 66 - column 3 line 6), signal estimate data corresponding to at least said second interference signal I_{VM} (abstract and column 2 line 53 - column 3 line 7);

generating, via amplitude and phase control circuit 3, phase detector means, voltage integrator means, and adder means (first/second/fourth/fifth components) (figures 2A and 2B and column 2 line 66 - column 3 line 6), therefrom an estimated second signal I_{VM} (abstract, column

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2 line 53 - column 3 line 7, and column 4 lines 36-62); and

further processing, via combiner 4 (third/sixth component) (figures 2A and 2B), said processed signal in accordance with said estimated second signal I_{VM} (abstract, column 2 lines 42-60, column 4 lines 12-25, and column 4 line 39 - column 5 line 11).

Consider **claims 22 and 41**, and **as applied to claims 21 and 40 above**, Kaitsuka further discloses that said combiner 4 (third/sixth component) (figures 2A and 2B) is configured to derive at least one parameter (e.g., phase, amplitude) of said estimated second signal I_{VM} for subsequent use (abstract, column 2 lines 42-60, column 4 lines 12-25, and column 4 line 39 - column 5 line 11).

Consider **claims 25 and 44**, and **as applied to claims 22 and 41 above**, Kaitsuka also discloses that said subsequent use comprises processing a signal I_M derived from said uplink signal in accordance with said parameter (e.g., phase, amplitude) to reduce the magnitude of said second interference signal I_{VM} therein (abstract, column 2 lines 42-60, column 4 lines 12-25, and column 4 line 39 - column 5 line 11).

Consider **claims 26 and 45**, and **as applied to claims 21 and 40 above**, Kaitsuka further discloses that said combiner 4 (third/sixth component) (figures 2A and 2B) is configured to subtract said estimated first signal I_{VM} (abstract, column 2 lines 53-60, and column 4 lines 39-62).

Consider **claims 28 and 32**, Kaitsuka also shows and discloses a satellite communications system comprising at least one satellite in orbit about the Earth, and being for receiving a user uplink signal from a user terminal adjacent the Earth, in the presence of

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interference (e.g., co-channel interference) from at least one interference source adjacent the Earth (abstract and column 1 lines 5-14), further comprising an interference compensation system (interference mitigation apparatus/component) (figures 2A and 2B) configured to perform the method of **claim 21**.

Consider **claim 30**, and **as applied to claim 28 above**, Kaitsuka further discloses that the system comprises an Earth station, in which said satellite is a repeater and is arranged to transmit the content of said user uplink signal on a feeder downlink signal to said Earth station, and in which said interference compensation system (interference mitigation component) (figures 2A and 2B) is on Earth and in communication with said Earth station (column 1 lines 5-14).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness

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or nonobviousness.

14. **Claims 18, 19, 37, and 38** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kaitsuka (U.S. Patent # 4,384,366)** in view of **well known prior art (MPEP 2144.03)**.

Consider **claim 18, 19, 37, and 38**, and **as applied to claims 16 and 35 above**, Kaitsuka clearly shows and discloses the claimed invention except that said parameter comprises delay or Doppler shift.

Nevertheless, the Examiner takes Official Notice of the fact that it is notoriously well known in the art estimate interference signals in accordance with parameters such as delay or Doppler shift for actual characterization of a satellite communication environment.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to generate the estimated interference signal in accordance with delay or Doppler shift as known in the art in the method of Kaitsuka for purposes of actual characterization of the satellite communication environment.

15. **Claims 23 and 42** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kaitsuka (U.S. Patent # 4,384,366)** in view of **Matsue et al. (U.S. Patent # 6,023,463)**.

Consider **claims 23 and 42**, and **as applied to claims 22 and 41 above**, Kaitsuka clearly shows and discloses the claimed invention except that deriving at least one parameter comprises demodulating said second signal.

In the same field of endeavor, Matsue et al. clearly show and discloses an interference

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cancellation system in which an interference signal is demodulated in order to compensate for it, thereby suggesting the derivation of a parameter that will be used for purposes of compensation (column 10 lines 40-64).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to demodulate the interference signal to derive a parameter as taught by Matsue et al. in the method and apparatus disclosed by Kaitsuka for the purpose of interference compensation.

16. **Claims 24 and 43** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kaitsuka (U.S. Patent # 4,384,366)** in view of **Matsue et al. (U.S. Patent # 6,023,463)**, as applied to **claims 23 and 42**, and further in view of **Carlin (U.S. Patent # 4,535,476)**.

Consider **claims 24 and 43**, and as applied to **claims 22 and 41 above**, Kaitsuka, as modified by Matsue et al., clearly shows and discloses the claimed invention except remodulating said second signal and processing a signal derived from said uplink signal in accordance with said remodulated second signal to reduce the magnitude of said second interference signal therein.

In the same field of endeavor, Carlin clearly shows and discloses an interference canceling receiver in which an estimated interference signal is modulated and used for processing a desired signal and obtained a corrected signal (column 3 line 54 - column 4 line 19).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to remodulate an interference signal and used for generating a corrected

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signal as taught by Carlin in the combined method and apparatus disclosed by Kaitsuka and Matsue et al. for the purpose of interference compensation.

17. **Claims 27, 29, and 31** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Kaitsuka (U.S. Patent # 4,384,366)** in view of **Wiedeman (U.S. Patent # 6,023,463)**.

Consider **claims 27 and 31**, Kaitsuka also shows and discloses a satellite communications system comprising at least one satellite in orbit about the Earth, and being for receiving a user uplink signal from a user terminal adjacent the Earth, in the presence of interference (e.g., co-channel interference) from at least one interference source adjacent the Earth (abstract and column 1 lines 5-14), further comprising an interference compensation system (interference mitigation apparatus/component) (figures 2A and 2B), wherein said interference compensation system (interference mitigation apparatus/component) comprises a component configured to iteratively form an interference estimate from data in accordance with at least one variable parameter (e.g., phase, amplitude), for locating a value thereof to maximize the mitigation of said uplink signal, and for processing said uplink signal in accordance with said value and said interference data (abstract, column 1 lines 5-14, column 2 line 53 - column 3 line 6, column 4 line 39 - column 5 line 11, and column 6 lines 26-58).

However, Kaitsuka does not specifically disclose an interference store for storing interference data characterizing at least a first signal.

In the same field of endeavor, Wiedeman clearly shows and disclose a satellite interference avoidance system comprising, among other components, a historical database

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(interference store) for storing interference data characterizing external interference (at least a first signal) in a coverage area (column 2 line 61 - column 3 line 2).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the historical database taught by Wiedeman in the system disclosed by Kaitsuka for the purpose of enhancing the performance of the system.

Consider **claim 29**, and **as applied to claim 27 above**, Kaitsuka, as modified by Wiedeman, further discloses that the system comprises an Earth station, in which said satellite is a repeater and is arranged to transmit the content of said user uplink signal on a feeder downlink signal to said Earth station, and in which said interference compensation system (interference mitigation component) (figures 2A and 2B) is on Earth and in communication with said Earth station (column 1 lines 5-14).

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

Brady et al. (U.S. Patent # 4,320,535) disclose an adaptive interference suppression arrangement;

Endo (U.S. Patent # 4,965,809) discloses an uplink cross-polarization interference canceller using correlation calculator and stepwise tracking controller; and

Krasner (U.S. Patent # 6,236,354 B1) discloses reducing satellite signal interference in a

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global positioning system receiver.

19. Any response to this Office Action should be **faxed to (703) 872-9306 or mailed to:**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

220 S. 20th St.
Crystal Plaza Two, Lobby, Room 1B03
Arlington, VA 22202

20. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Rafael Perez-Gutierrez whose telephone number is (703) 308-8996. The Examiner can normally be reached on Monday-Thursday from 6:30am to 5:00pm.

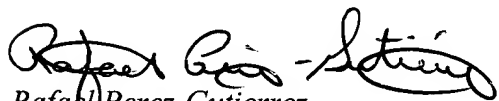
If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Marsha D. Banks-Harold can be reached on (703) 305-4379. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700 or call customer service at (703) 306-0377.



Rafael Perez-Gutierrez

R.P.G./rpg **RAFAEL PEREZ-GUTIERREZ**
PATENT EXAMINER

September 13, 2004